



**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

LM PD

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

09/498,254 02/03/00 ZEDIKER

M D9353-RE

┌

MMC2/0321

EXAMINER

Westerlund & Powell PC
122 n Alfred Street
Alexandria VA 22314

LEUNG, S ART UNIT	PAPER NUMBER
----------------------	--------------

2881
DATE MAILED:

03/21/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/498,254

Applicant(s)

ZEDIKER ET AL.

Examiner

Quyen P. Leung

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-24 is/are allowed.
- 6) ☒ Claim(s) 25-41 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3-1/2.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

DETAILED ACTION

Claims 1-41 are pending.

Claims 25-41 are rejected under 35 U.S.C. 251 as being an improper recapture of broadened claimed subject matter surrendered in the application for the patent upon which the present reissue is based. See *Hester Industries, Inc. v. Stein, Inc.*, 142 F.3d 1472, 46 USPQ2d 1641 (Fed. Cir. 1998); *In re Clement*, 131 F.3d 1464, 45 USPQ2d 1161 (Fed. Cir. 1997); *Ball Corp. v. United States*, 729 F.2d 1429, 1436, 221 USPQ 289, 295 (Fed. Cir. 1984). A broadening aspect is present in the reissue which was not present in the application for patent. The record of the application for the patent shows that the broadening aspect (in the reissue) relates to subject matter that applicant previously surrendered during the prosecution of the application. Accordingly, the narrow scope of the claims in the patent was not an error within the meaning of 35 U.S.C. 251, and the broader scope surrendered in the application for the patent cannot be recaptured by the filing of the present reissue application.

The limitation of $N \geq 2$ optical fibers omitted in the reissue claims was present in the claims of the original application. The examiner's reasons for allowance in the original application stated that it was that limitation $N \geq 2$ optical fibers which distinguished over a potential combination of references X and Y. Applicant did not present on the record a counter statement or comment as to the examiner's reasons for allowance, and permitted the claims to issue. The omitted limitation is thus established as relating to a subject matter previously surrendered. See MPEP 1412.02.

Information Disclosure Statement

The information disclosure statement filed 1/8/2001 has been placed in the application file, and the information referred to therein has been considered. See the attached, initialed copy.

Claim Objections

Claim 32 is objected to because of the following informalities: Claim 32 ends with a semicolon when it should end in a period. Appropriate correction is required.

Claim 40 is objected to because of the following informalities: In line 5 "an optical path" should be replaced with —a first optical path—, so that "said first... optical paths" in lines 13-14 would have antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

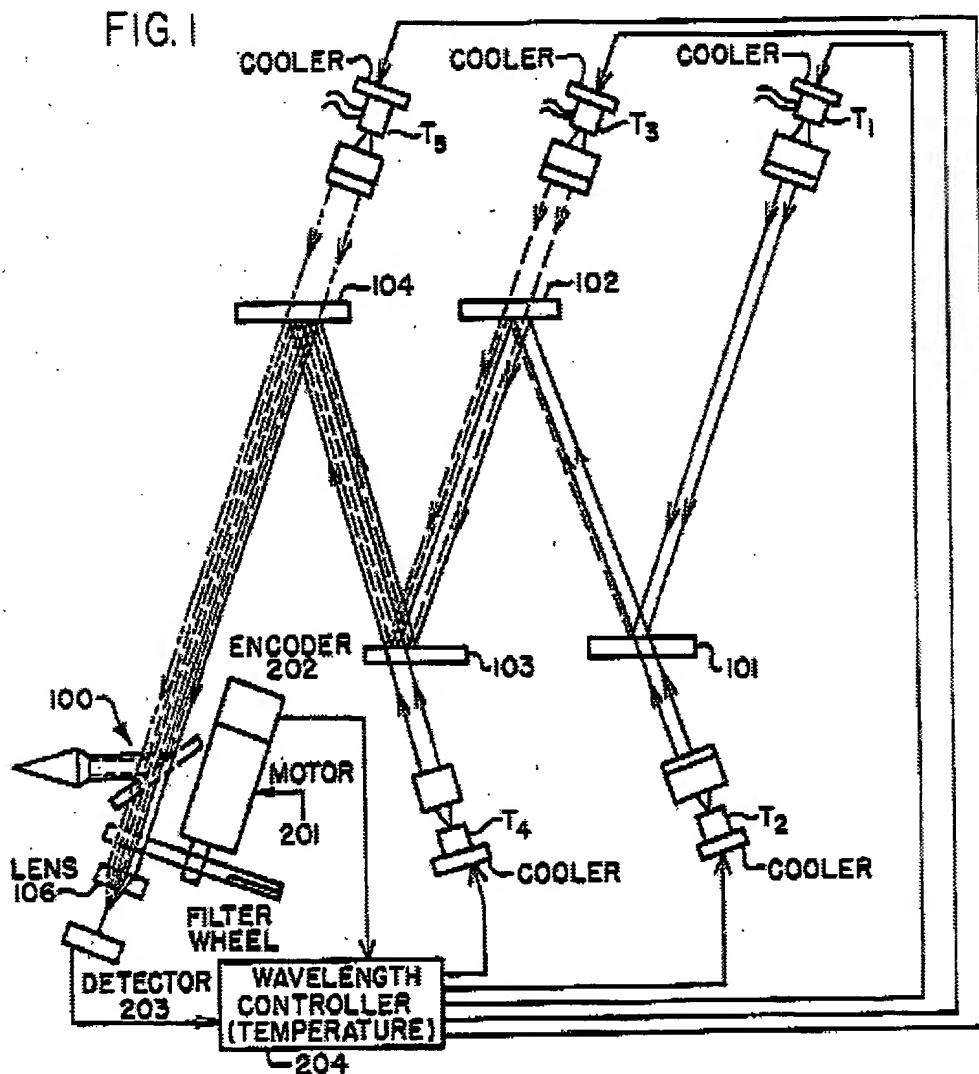
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 25-27, 29-31, and 33-35 are rejected under 35 U.S.C. 102(b) as being anticipated by Casey (4,823,357). Casey discloses the claimed invention.

Art Unit: 2881

Regarding claim 25, Figure 1 illustrates a laser head assembly generating an output beam, the laser head assembly including M modules (T1, T2, T3, T4, T5) which generate M laser beams, wherein each of the M laser beams has a different single wavelength (see col. 4 lines 3-9); and M-2 dichroic filters (101, 102, 103), wherein each



of the M-2 dichroic filters transmits a corresponding one of the M laser beams and reflects all other of the M laser beams into a predetermined optical path to produce the output beam, where M is an integer ≥ 2 .

Regarding claim 26, Figure 1 illustrates a laser head assembly generating an output beam, the laser head assembly including M modules (**T1, T2, T3, T4, T5**) which generate M laser beams, wherein each of the M laser beams occupies a different wavelength band(see col. 4 lines 3-9); and M-R dichroic filters (**101, 102, 103**), wherein each of the M-R dichroic filters transmits at least one of the M laser beams occupying a given wavelength band and reflects all other of the M laser beams not occupying the given wavelength band; and an optical device (**104**, see col. 4 lines 35-41) which combines the M laser beams to thereby produce the output beam, where M and R are positive integers; and M is an integer ≥ 2 .

Regarding claim 27, see col. 4 lines 32-41 for the teaching about that the optical device comprises means **104** for collecting the M laser beams.

Regarding claim 29-30 and 35, see col. 7 lines 64-68 about the polarization beam combiner for doubling the laser output by combining two combined laser beams.

Regarding claim 31, Figure 1 illustrates a laser head assembly generating an output beam including M laser beams, comprising M modules (**T1, T2, T3, T4, T5**) which generate M laser beams, wherein each of the M laser beams has a different single wavelength (see col. 4 lines 3-9); and M-2 dichroic filters (**101, 102, 103**), wherein each of the M-2 dichroic filters transmits a corresponding one of the M laser beams and reflects all other of the M laser beams; where M is an integer ≥ 2 .

Regarding claim 33, Figure 1 illustrates a method for generating a high energy laser beam comprising (a) generating P collimated laser beams (see col. 4 lines 3-9 for the teaching of diode laser arrays, i.e. P laser beams, and see col. 4 lines 16-17 for the

Art Unit: 2881

teaching of collimated laser beams via diffraction limited lenses); (b) repeating step (a) M times so as to produce MxP collimated laser beams having M different wavelengths (λ_1 - λ_5 – see col. 4 lines 3-9); and (c) coupling the MxP collimated laser beams into an optical path (via elements **101, 102, 103, 104**) to produce a high energy laser beam (see col. 4 lines 24-41), wherein M and P are integers ≥ 2 .

Regarding claim 34, note step (c.) comprises dichroically coupling the MxP collimated laser beams into the optical path is taught by Casey because elements **101...104** are dichroic filters.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

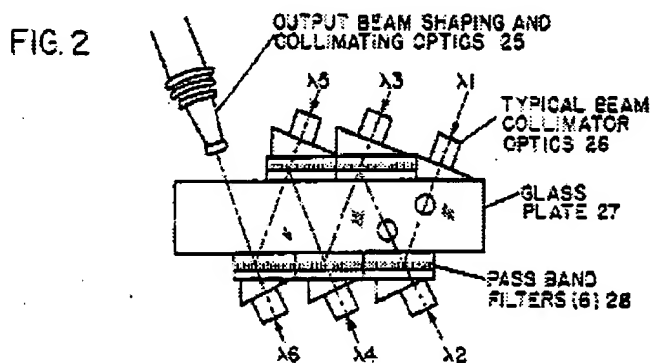
Claims 28, 32, 36-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Casey.

Regarding claims 28, 32, and 36-40, Casey has been discussed above except for a fiber coupling device. As evidenced in Casey's col. 2 lines 11-21, optical fibers are well-known for transmitting laser diode output beams in optical communication systems. Fiber coupling devices are well-known for efficiently coupling laser diode output beam to the optical fiber. It would have been obvious to one of ordinary skill in the art to modify Casey by employing an fiber coupling device, as is well-known, for the advantageous

Art Unit: 2881

benefit of efficiently transmitting laser diode output beam in optical communication systems.

Regarding claim 41, Casey has been discussed above except for coupling the $M \times P$ collimated laser beams into an i th optical fiber, where $i=1$ to N and N can be 1. Casey's Figure 2 illustrates a method for generating a high energy laser beam comprising (a) generating P collimated laser beams (see col. 4 lines 3-9 for the teaching of diode laser arrays, i.e. P laser beams, and see element 26 for collimating the laser beams (λ_1 - λ_6); (b) repeating step (a) M times so as to produce $M \times P$ collimated laser beams having M different wavelengths (λ_1 - λ_6); and (c) coupling the $M \times P$ collimated laser beams into an optical path (via elements 28); wherein M and P are positive integers and both M and $P \geq 2$.



As evidenced in Casey's col. 2 lines 11-21, optical fibers are well-known for transmitting laser diode output beams in optical communication systems. It would have been obvious to one of ordinary skill in the art to modify Casey by employing an optical fiber, as is well-known, for the advantageous benefit of transmitting laser diode output beam in optical communication systems.

All wabl Subject Matter

Claims 1-24 are allowed.

The following is an examiner's statement of reasons for allowance:

The prior art cited on the form PTO-1449 represent the most relevant prior art known. However, Applicant's claimed invention distinguishes over the prior art for the following reasons.

The claims are allowable over the prior art of record because none of the references either alone or in combination, discloses or renders obvious, the following:

a. As per claims 1-8, a diode laser system comprising M modules generating M laser beams, wherein each laser beam has a different single wavelength, M-2 dichroic filters, wherein each of the M-2 dichroic filters transmits a corresponding one of the M laser beams and reflects all other of the M laser beams, a fiber coupling device for collecting the M laser beams for generating one of N output beams, N optical fibers for receiving respective ones of N output beams and generating N received output beams, and an optical assembly for focusing the N received output beams on a single spot, where N and M are both ≥ 2 .

b. As per claims 9-13 a diode laser system comprising M first modules generating M first laser beams, wherein each first laser beam has a different single wavelength, M-1 first dichroic filters defining a first optical waveguide for directing all of the M first laser beams into a first optical path, wherein each of the M-1 first dichroic filters transmits a corresponding one of the M first laser beams and reflects all other of the M first laser beams, a fiber coupling device disposed adjacent the first optical path

Art Unit: 2881

collecting the M first laser beams to produce one of N output beams, N optical fibers for receiving respective ones of N output beams and generating N received output beams, and an optical assembly for recollimating and focusing the N received output beams on a single spot, where N and M are both ≥ 2 .

c. As per claims 14-20, a diode laser system comprising means for generating N laser beams, wherein each of the N laser beams includes multiple wavelengths of light and the generating means comprises M first means for generating M first laser beams, wherein each first laser beam has a different single wavelength, M-1 first filter means defining a first optical waveguide for directing all of the M first laser beams into a first optical path, wherein each of the M-1 first filter means transmits a corresponding one of the M first laser beams and reflects all other of the M first laser beams, a fiber coupling device disposed adjacent the first optical path collecting the M first laser beams to produce one of N output beams, N optical fibers for receiving respective ones of N output beams and generating N received output beams, and an optical assembly for recollimating and focusing the N received output beams on a single spot, where N and M are both ≥ 2 .

As per claims 21-24, a method for generating a high energy laser beam comprising:

- (a) generating P collimated laser beams having an Mth wavelength
- (b) repeating step (a) M times to produce MxP collimated laser beams having M different wavelengths,
- (c) coupling said MxP collimated laser beams into an optical path,

Art Unit: 2881

(d) coupling the MxP collimated laser beams into an i th optical fiber, where $i=1$ to N ,

(e) repeating steps (a) through (d) N times to generate N output laser beams,

(f) recollimating the N output laser beams to produce N recollimated laser beams and

(g) focusing the N recollimated laser beams onto a single spot where M , N , P are integers ≥ 2 .

Applicant provides the advantageous benefits of the claimed invention in col. 4, a benefit of which includes attaining a diode laser system which would not require both a large amount of real estate and complex optical assemblies to couple the outputs of a plurality of output modules to a single spot.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quyen P. Leung whose telephone number is (703) 308-0545. The examiner can normally be reached on 8:30-5:00, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teresa Arroyo can be reached on (703) 308-4782. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Art Unit: 2881

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


Quyen P. Leung
Examiner
Art Unit 2881

QPL
March 21, 2001